

Lime

Jacqueline K. Burns

Citrus Research and Education Center, IFAS

University of Florida, Lake Alfred, FL

Scientific Name and Introduction: Limes are thought to have originated in northeast India. Persian lime (also known as Bearss or Tahiti, *Citrus latifolia* Tan.) is the principle type grown in the U.S. Commercial Persian lime production is now less than 2000 ha and limited to South Florida and Southern California (Saunt, 2000). Persian and Key lime (*Citrus aurantifolia* Swing.) trees are popular in backyard settings, where they are commonly placed in large pots that are easily moved indoors during cold weather. Persian limes are seedless or nearly so, whereas Key limes contain numerous seeds.

Quality Characteristics: High quality limes should be oval, firm, with smooth peel and deep green (Persian) or green and/or yellow (Key lime) color. Limes should be turgid, and free from decay, splitting and blemishes.

Maturity Standards, Grade Standards and Packing: Persian limes must attain a size of 4.76 cm (1.87 in) in diameter and a juice content of 42% by volume. There are no size requirements for Key lime, but juice content must be 42% by volume (Wardowski et al., 1995). Persian limes are packed in 10 lb (4.5 kg), 20 lb (9.1 kg) , and 40 lb (18.2 kg) cartons for storage and shipping (Roy et al., 1996).

Ethylene Production and Respiration: Under optimal storage conditions, respiration rates of limes are $< 10 \text{ mg CO}_2 \text{ kg}^{-1} \text{ h}^{-1}$. The rate of ethylene production is $< 0.1 \text{ } \mu\text{L kg}^{-1} \text{ h}^{-1}$ at 20 °C (Arpaia and Kader, 2000).

Storage: Limes should be cooled and stored at 10 °C with 95% RH. Under optimal conditions, limes can be stored up to 8 weeks. CA storage can retard senescence, but commercial use is very limited.

Physiological Disorders: Styler-end breakdown can be a significant problem with limes. Styler-end breakdown begins as an apparent breakdown of tissues at the styler end of the fruit. Typically the styler-end takes on a wet appearance. Large, mature fruit are more susceptible. The incidence of the disorder can be aggravated by high field heat and rough handling (Davenport and Campbell, 1977; Malo and Campbell, 1994). Exposing limes to temperatures below the optimum storage temperature can result in chilling injury. Chilling injury is characterized by peel pitting. Oleocellosis can develop on the peel if hand harvest begins early in the morning or immediately after rainfall when the peel is turgid.

Postharvest Pathology and Control: Key lime is very susceptible to stem-end rot caused by *Diplodia natalensis* and anthracnose (*Colletotricum*). Stem-end rots caused by *D. natalensis*, *Phomopsis citri*, and *Alternaria citri* are important postharvest diseases in Persian lime. In addition, green and blue mold (*Penicillium digitatum* and *P. italicum*, respectively) can enter through wounds made during harvesting and handling and appear in storage. Careful handling to minimize mechanical damage can help to reduce blue and green mold. Proper sanitation of packingline equipment and use of postharvest fungicides aid in reduction of postharvest diseases.

Quarantine Issues: Appearance of citrus canker (*Xanthomonas axonopodis* pv. *citri*) has restricted movement of limes grown in south Florida. Compliance with the Citrus Canker Eradication Program (2000) is required to market limes from quarantined areas.

Suitability as a Fresh-cut Product: No current potential.

References:

- Arpaia, M.L. and A.A. Kader. 2000. Lime. Recommendations for Maintaining Postharvest Quality. <http://postharvest.ucdavis.edu/Produce/ProduceFacts/Fruit/lime.html>.
- Citrus Canker Eradication Program. 2000. <http://doacs.state.fl.us/~pi/canker/menu1.htm>.
- Davenport, T.L. and C.W. Campbell. 1977. Stylar-end breakdown in 'Tahiti' lime: aggravating effects of field heat and fruit maturity. J. Amer. Soc. Hort. Sci. 102:484-486.
- Malo, S.E. and C.W. Campbell. 1994. The Tahiti lime. Univ. Florida Coop. Ext. Fact Sht. FC-8.
- Roy, M., C.O. Andrew and T.H. Spreen. 1996. Persian Limes in North America. An Economic Analysis of Production and Marketing Channels. Florida Sci. Source, Inc. Lake Alfred FL.
- Saunt, J. 2000. Citrus varieties of the world. Sinclair International Limited, Norwich, England.
- Wardowski, W., J. Whigham, W. Grierson and J. Soule. 1995. Quality tests for Florida citrus. Univ. Florida Coop. Ext. Bull. SP66.